



***Heterodera betae*: the nematode and methods for sustainable control**

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Abstract

Integrated Pest Management (IPM) should be implemented according to the Sustainable Use Directive (SUD; 2009/128/EC) of the European Union by 2014. In a project about sustainability, the sugar beet research institute IRS will describe the diverse set of measures of IPM that can be used to prevent or control pest damage in sugar beet in the Netherlands. Data of the SUSY (Speeding Up Sugar Yield) project and data of former and recent sugar beet research are used. From the SUSY project, it was concluded that the yellow beet cyst nematode (*Heterodera betae*) was one of the most important factors explaining low sugar yield on sandy soils. Moreover, this nematode is often found in plant and soil samples in the diagnostic department. *H. betae* will be used as an example to demonstrate how IPM is developed and applied in sugar beet in the Netherlands.

H. betae occurs in many countries in Europe. In the Netherlands it causes sugar yield losses on sandy soils. A high infestation can even result in sugar beet plant losses. In the south eastern and north eastern part of the Netherlands it occurs on 18% and 5% of the fields, respectively. Since hardly any sustainable methods were available to control *H. betae*, research was done in order to investigate the host status of different green manure crops and sugar beet varieties. The resistant cruciferous green manure crops white mustard (*Sinapsis alba*) and oil seed radish (*Raphanus sativus* spp. *oleiferus*) were found to be a good tool for growers in the control of this nematode. Sugar beet varieties with resistant genes of *Beta maritima*, known to be partially resistant to the white beet cyst nematode (*H. schachtii*) resulted in higher yields and a lower final population density of *H. betae* in comparison with varieties susceptible to *H. schachtii*. Therefore, resistant cruciferous green manure crops and partially resistant sugar beet varieties are sustainable methods to control *H. betae*.